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The invention concerns a hockey stick with a head, a grasp and this connecting shank, whereby the hockey stick at least partly consists of a fiber-reinforced plastic. The invention concerns a far procedure for manufacturing a hockey stick.

Hockey sticks were originally manufactured only from wood. From this production from wood results the rectangular cross section, which the hockey stick within the range of the head, the shank and the grasp exhibits. From this it results also that a hockey stick over its entire length consists of only one material. This applies both to from wood manufactured and to the hockey sticks manufactured today from plastic.

After hockey sticks were originally manufactured only from wood, one turned into then to strengthen this wood at its surface with fibers and synthetic resin. Subsequently, one built hockey sticks with a core from foam material and a shroud from fibers and synthetic resin, which were wet up-laminated with the hand. A in this way manufactured hockey stick consisted to 50% of foam material and to 50% of fibers and synthetic resin. In a further Entwicklungsstufe the core and dry fibers consisting of foam material were inserted into an injection mold. Such manufacture-proceed is well-known under the name transfer Injection mol thing. The production of the hockey sticks went through thereby the same way as the production of other articles. Originally these were made also only of the natural product wood, while they are made today exclusively of plastics.

The invention continues this way. You are the basis the task to manufacture a hockey stick exclusively after the newest state of the art and completely freely from the well-known manufacturing processes to. Is to be thought also of the desires of the Hockeyspieler. Finally is the hockey stick its conventional form, i.e. its rectangular cross section, maintained, although neither the firmness nor the play with the hockey stick require this form.

With a hockey stick of the kind initially specified this task is solved after the invention by the fact that head and shank consist both of two to each other parallel running hollow sections and both hollow sections exhibits a common center wall and consists of fiber-reinforced plastic. Head and shank consist thereby appropriately both of Prepeg. By Prepeg one understands a Tape, a unidirectional volume, available in the trade, which exists pre-impregnated fibers out with synthetic resin. From Prepeg of manufactured hockey sticks a so large resistance moment and a so high firmness have that it does not have to be substantial for reaching its target firmness. Therefore the hockey stick according to invention consists of two to each other parallel hollow sections, whose knocking against walls merged together into a common center wall. These two running hollow sections result in once the desired target firmness parallel to each other and lead on the other hand to the desired rectangular cross section.

▲ top The inner walls of both hollow sections consist appropriately of a hose. This preferably consists of a PP or a silicone. In an appropriate execution form the grasp is einstückig trained with the head and the shank in a processing step and.

The well-known, continuous hockey sticks consisting of plastic are relatively rigid. The impact developing with the impact of the head on the ball is passed thereby into the grasp and moved

from there in the hand and the wrist of the player. In the long run this loading and damages the wrist works. For the avoidance of this load and damage of the wrist the invention plans in a further appropriate arrangement that the grasp consists of a thermoplastic plastic and is held on this on it turned the end of the shank partly postponed and. Thermoplastic plastics are more softly, flexible and springily. A grasp according to invention intercepts thereby the impacts and keeps it away from the wrist of the player. The grasp pushed onto the end of the shank can be held the shank glued on or without sticking in the press fit on this.

The procedure according to invention for manufacturing the managing marked hockey stick is characterised by the fact that a hose by for instance the double length of shank and head in U-form put, which in U-form lying hose coats and encases with Prepeg the hose encased with Prepeg into a form put, which form is closed, the hose is afterwards blown up and the form is heated. The two open ends of the hose should be turned to end of the shank in that the grasp to come. When first coating and encasing the hose with Prepeg in the form on nehmbare quantity, adjustment and situation of the Prepegs with a prototype one determines and one holds for following production. Thus one must determine only when first coating and encasing by repeated inserting of the blank into the form, how much Prepeg is needed each time in which place and in which adjustment.

By the example of the execution form shown in the design the hockey stick according to invention is now continued to describe. In the design is:

Fig. 1 an opinion of the hockey stick from the front,

Fig. 2 an opinion of the hockey stick of the side,

Fig. 3 a cut by the hockey stick along the cut line A-A in Fig. 1,

Fig. 4 a cut by the hockey stick along the cut line B-B in Fig. 1,

Fig. 5 a cut by the hockey stick along the cut line CC in Fig. 1,

Fig. 6 a cut by the hockey stick along the cut line of dd in Fig. 1,

Fig. 7 a cut by the hockey stick along the cut line E-E in Fig. 1,

Fig. 8 a cut by the hockey stick along the cut line FF in Fig. 1,

Fig. 9 a cut by the hockey stick along the cut line G-G in Fig. 2 and

Fig. 10 an increased representation in Fig. 8 of encircled area.

The figures show the hockey stick 12 with its grasp 14, its shank 16 and the head 18. The grasp 14 is course-wound on it and into the Fig. 1 and 2 end of 20 of the shank 16 lying above postponed. This grasp 14 consists of a thermoplastic plastic. In accordance with the representations in the Fig. 3 and 4 he has circular cross-section.

In approximately circular cross-section the shank has 16 also still in the cutting plane CC. In the further cutting planes of dd to G-G the shank 16 and the head 18 exhibit the rectangular cross section mentioned. Within these ranges the shank 16 and the head 18 by the two hollow sections 22 and 24 with the common center wall 26 are formed. The inner walls of the two hollow sections 22 and 24 are formed by the hose 28.

For the production of the hockey stick as the first the still straight hose 28 is occupied by hand and encased with Prepeg. Subsequently, the hose 28 is put to a U and within the range of the head turns. The hose lying in form of a U forms a double hose. With first vouchers and encasing one held, which length or which quantity of Prepeg is needed. These numbers are held. With the number, adjustment and position of the Prepeglagen determined with the building of the Protops each further double hose is completed. After all pieces and strip of the Prepeg NAK construction plan are presented, the double hose occupied with Prepeg is put into a female form of the hockey stick. This form is locked and heated. The hose 28 is blown up. It presses viscous the Prepeg become under the effect of the heat against the inner walls of the form. At expiration of a certain, from the type of resin and the height of the temperature dependent time the resin is hardened. The finished hockey stick 12 can be taken from the form. If necessary its surface must be still worked

on and burr be removed. If it concerns the execution form, with which the grasp 14 was made separately of a thermoplastic material, these in a last processing step onto the end of 20 of the shank 16 is pushed. The dimensions are met either in such a way that the grasp 14 in the press fit on the end 20 sits, or the grasp 14 is glued on.

The cuts of the Fig. 3 to 9 shows the cross section of the hockey stick 12 on the basis of the grasp 14 up to the head 18. This way the cross section changes from a circle into a rectangle form. At the same time one recognizes the large hollow sections 22 and 24. Those of this umschlossenen air spaces lead to the small weight of the hockey stick according to invention 12. The external walls and the common center wall 26 lend a wabenförmige and thus stable structure to it. Fig. 10 shows in increased representation and not full-scale the hose 28. This forms, like already in Fig. , the inner wall of the two hollow sections 22 and 24 is suggested to 7.